

What is claimed is:

1. A power supply system comprising:  
a package housing;  
a first module, located within the package housing, the first module comprising at least one first power conversion switch structured to perform power conversion switching to facilitate conversion of a first power input signal into a first power output signal; and  
a second module, located within the package housing, the second module comprising at least one second power conversion switch structured to perform power conversion switching to facilitate conversion of a second power input signal into a second power output signal.
2. The system of claim 1 further comprising a third module, located within the package housing, the third module comprising at least one third power conversion switch structured to perform power conversion switching to facilitate conversion of a third power input signal into a third power output signal.
3. The system of claim 2 further comprising a fourth module, located within the package housing, the fourth module comprising at least one fourth power conversion switch structured to perform power conversion switching to facilitate conversion of a fourth power input signal into a fourth power output signal.
4. The system of claim 3 further comprising a fifth module, located within the package housing, the fifth module comprising at least one fifth power conversion switch structured to perform power conversion switching to facilitate conversion of a fifth power input signal into a fifth power output signal.
5. The system of claim 4 wherein all power conversion switches required for respectively converting the first through fifth power input signals into the first through fifth power output signals are located within the package housing.

6. The system of claim 1 wherein all power conversion switches required for respectively converting the first and second power input signals into the first and second power output signals are located within the package housing.

7. The system of claim 1 wherein:  
the first power input signal is a dc signal;  
the first power output signal is a dc signal;  
the second power input signal is a dc signal; and  
the second power output signal is a dc signal.

8. The system of claim 1 wherein:  
the first power input signal is a dc signal;  
the first power output signal is an ac signal;  
the second power input signal is a dc signal; and  
the second power output signal is a dc signal.

9. The system of claim 1 wherein:  
the at least one first power conversion switch is structured to perform ultra high efficiency power conversion; and  
the at least one second power conversion switch is structured to perform ultra high efficiency power conversion.

10. The system of claim 1 wherein:  
the at least one first power conversion switch is structured to perform high efficiency power conversion; and  
the at least one second power conversion switch is structured to perform high efficiency power conversion.

11. The system of claim 1 wherein the at least one first power conversion switch is structured to perform low efficiency power conversion.

12. The system of claim 1 wherein:  
the first module comprises at least two first power conversion switches structured to perform power conversion switching to facilitate conversion of the first power input signal into the first power output signal; and  
the second module comprises at least two second power conversion switches structured to perform power conversion switching to facilitate conversion of the second power input signal into the second power output signal.
13. The system of claim 1 wherein the system is high power.
14. The system of claim 1 wherein the system is low power.
15. The system of claim 1 further comprising the core of a central processing unit, wherein the at least one first power conversion switch is operable so that the first power output signal has an adjustable voltage output in the range of about + 0.5 volts to +2.0 volts and is suitable for supporting the core.
16. The system of claim 15 wherein the at least one second power conversion switch is operable so that the second power output signal has an adjustable voltage output in the range of about + 0.5 volts to +2.0 volts and is suitable for supporting the core.
17. The system of claim 1 wherein the first power output signal has a voltage of about +5 volts.
18. The system of claim 1 wherein the first power output signal has a voltage of about +3.3 volts.
19. The system of claim 1 wherein the first power output signal has a voltage of about +1.8 volts.

20. The system of claim 1 wherein the first power output signal has a voltage of about +2.5 volts.
21. The system of claim 1 wherein the first power output signal has a voltage of about +12 volts.
22. The system of claim 1 wherein the system comprises a bridge between at least one power supply and a central processing unit.
23. The system of claim 1 further comprising a flip chip style die, including the first module and the second module, wherein the package housing is a flip chip style housing.
24. The system of claim 1 further comprising at least one semiconductor die, the at least one semiconductor die including the first module and the second module.
25. The system of claim 1 further comprising a control logic block, located within the package housing, the control logic block being structured and located to at least partially control the operation of the at least one first power conversion switch and the at least one second power conversion switch.

26. The system of claim 25 further comprising:  
a first switch driver for controlling the position of the at least one first power conversion switch;

a second switch driver for controlling the position of the at least one second power conversion switch;

a control input / output port, located within the package housing, the control input / output port being structured and located to receive at least one communication signal from outside of the package housing, wherein:

a mode of the first and second power conversion switches is determined by the communication signal; and

the operation of the first and second switch drivers is controlled by the control logic block based at least in part by the mode.

27. The system of claim 1 further comprising a control input / output port, located within the package housing, the control input / output port being structured and located to receive at least one communication signal from outside of the package housing.

28. The system of claim 27 wherein the control input / output port is a serial port.

29. The system of claim 27 wherein the control input / output port comprises a USB port.

30. The system of claim 27 wherein the control input / output port comprises an I2C port.

31. The system of claim 27 wherein the control input / output port comprises a fixed port.

32. The system of claim 27 wherein the control input / output port comprises a SMBus port.

33. The system of claim 1 further comprising:  
a computer; and  
an on / off control block, located within the housing, the on / off control block being structured and located to initiate a power up process for the computer.

34. The system of claim 33 wherein:  
the computer comprises an on / off switch; and  
the on / off control block comprises an on / off port for interfacing with the on / off switch.

35. The system of claim 33 wherein the on / off port is designed for ultra-low power consumption when the computer is in a power-off condition.

36. The system of claim 33 further comprising a computer including an embedded controller, wherein the on / off control block comprises an embedded controller power-up module structured and located to power up the embedded controller.

37. The system of claim 1 further comprising:  
a first battery;  
a first battery-charging output, located within the package housing, the first battery charging output having an adjustable voltage and current suitable for charging the first battery;  
a first battery current path structured and located to electrically connect the first battery and the first battery-charging output so that the first battery can be charged by electrical power from the first battery-charging output.

38. The system of claim 37 further comprising a serial battery communication interface, located within the package housing, for communication with the battery.

39. The system of claim 37 further comprising:

a second battery;

a second battery-charging output, located within the package housing, the second battery charging output having an adjustable voltage and current suitable for charging the second battery;

a second battery current path structured and located to electrically connect the second battery and the second battery-charging output so that the second battery can be charged by electrical power from the second battery-charging output.

40. The system of claim 1 further comprising:

a transformer suitable for powering a display backlight;

an ac output, located within the package housing, the ac output having adjustable voltage and/or current so that it is suitable for powering the transformer; and

a transformer current path structured and located to electrically connect the transformer and the ac output so that the transformer can be powered by electrical power from the ac output.

41. A computer system comprising:
- a power source for providing at least one power input signal;
  - a switching power supply for receiving the at least one power input signal from the power source;
  - a central processing unit requiring at least a first CPU power signal and a second CPU power signal for operation;
  - a plurality of CPU current paths for electrically connecting the switching power supply to the central processing unit;
  - a memory requiring at least one memory power signal for operation; and
  - a memory current path for electrically connecting the switching power supply to the memory;
- wherein the switching power supply comprises:
- a package housing; and
  - a plurality of power conversion switches, with the power conversion switches all being located within the package housing, and with the power conversion switches being structured, controlled and located to provide the power conversion switching necessary to convert the at least one power input signal into a plurality of power output signals including:
    - the first CPU power signal, which is provided to the central processing unit through one of the plurality of CPU current paths;
    - the second CPU power signal, which is provided to the central processing unit through one of the plurality of CPU current paths; and
    - the memory power signal, which is provided to the memory through the memory current path.



42. The computer of claim 41 further comprising:  
a disk drive requiring at least one disk drive power signal for operation; and  
a disk drive current path for electrically connecting the switching power supply to the disk drive;

wherein the power conversion switches are structured, controlled and located to provide the power conversion switching necessary to convert the at least one power input signal into the disk drive power signal, which is provided to the disk drive through the disk drive current path.

43. The computer of claim 41 further comprising:  
a card bus requiring at least one card bus power signal for operation; and  
a card bus current path for electrically connecting the switching power supply to the card bus;

wherein the power conversion switches are structured, controlled and located to provide the power conversion switching necessary to convert the at least one power input signal into the card bus power signal, which is provided to the card bus through the card bus current path.

44. The computer of claim 41 further comprising:  
a fan requiring at least one fan power signal for operation; and  
a fan current path for electrically connecting the switching power supply to the fan;  
wherein the power conversion switches are structured, controlled and located to provide the power conversion switching necessary to convert the at least one power input signal into the fan power signal, which is provided to the fan through the fan current path.

45. The computer of claim 41 further comprising:  
a serial bus requiring at least one serial bus power signal for operation; and  
a serial bus current path for electrically connecting the switching power supply to the serial bus;  
wherein the power conversion switches are structured, controlled and located to provide the power conversion switching necessary to convert the at least one power input signal into the serial bus power signal, which is provided to the serial bus through the serial bus current path.

46. The computer of claim 45 wherein the serial bus is structured according to Universal Serial Bus standards.

47. A method of supplying power in a computer, the method comprising the following steps:

providing a switching power supply system for outputting a plurality of power output signals, the system comprising:

a package housing; and

a plurality of power conversion switches located within the package housing, the power conversion switches for performing the power conversion switching necessary to convert at least one power input signal into the plurality of power output signals; and controlling the operation of the power conversion switches by power management commands in order to selectively and individually control the plurality of power output signals.

48. The method of claim 47 wherein the controlling step comprises the following sub-steps:

sending power management commands from an input / output port on a South Bridge component of the computer through a Universal Serial Bus;

receiving the power management commands from the Universal Serial Bus through a control input / output port located within the package housing at a control logic module located within the package housing; and

driving the power conversion switches by the control logic module in accordance with the received power management commands.

49. The method of claim 47 wherein the controlling step comprises the following sub-steps:

sending power management commands from an input / output port on an embedded controller component of the computer;

receiving the power management commands through a control input / output port located within the package housing at a control logic module located within the package housing; and

driving the power conversion switches by the control logic module in accordance with the received power management commands.

50. The method of claim 49 where the power management commands are sent from the embedded controller to the control input / output port through an I2C bus.

51. The method of claim 49 where the power management commands are sent from the embedded controller to the control input / output port through an SMBus.

52. A switching power supply comprising:  
a package housing having an interior and having an exterior surface;  
an integrated circuit chip packaged within the packaged housing, the integrated chip including at least one power conversion switch for converting a first power input signal into a first power output signal; and  
an external power conversion component mounted to the exterior surface of the package housing, the external power conversion component for converting, in conjunction with at least one of the at least one power conversion switch, the first power input signal into the first power output signal.

53. The supply of claim 52 wherein the external power conversion component is a capacitor.

54. The supply of claim 53 wherein the external power conversion component is a high frequency capacitor.